REMARKS

Status

This Amendment is responsive to the Office Action dated August 8, 2007, in which Claims 1-28 were rejected. Claims 1, 11 and 27 have been amended; and new Claim 29 has been added. Accordingly, Claims 1-29 are pending in the application, and are presented for reconsideration and allowance.

Claim Rejection - 35 USC 103

Claims 1-28 stand rejected under 35 USC 103 as being unpatentable over US Patent No. 6,608,942 to Le and US Appl. 2003/0023150 to Yokoi. This rejection is respectfully traversed for the reasons discussed below.

Yokoi discusses a capsule type camera for capturing images in a human when it is swallowed.

Le discusses a system for detecting edges in an image and smoothing them. In particular Lee discusses detecting and smoothing jagged edges.

In contrast, claim 1 calls for "detecting low brightness areas where light rays are unable to reach directly in certain anatomical structures in the in vivo images" and "preserving a shape of the anatomical structures". Le does not teach or suggest such. Yokoi adds nothing to Le with respect to this feature. Withdrawal of the rejection of claim 1 for this reason is respectfully requested.

Similarly claims 11 and 27 recite "preserving any anatomical structures in low brightness areas where light rays are unable to reach directly". These claims are likewise patentably distinguishable over Le and Yokoi.

On page 2, of the Action, the Examiner asserts that Lee teaches "adjusting the exposure of the image with discontinuities preserved (Col. 12 Line 55 - Col 13 Line 60)". This text of Le particularly states:

> In step 672, the respective edge (i.e., East, North, West or South) of the target pixel is set as "ON". Processing then continues at step 670. While the flow diagrams of FIGS. 6A to 6C illustrate specific steps and ordering of steps, it will be apparent to one skilled in the art that modifications and/or changes to the particular steps and/or ordering of steps can be made to the edge detection process of the first embodiment without departing from the scope and spirit of the invention.
> In the foregoing manner, horizontal or vertical lines or curves can be determined. As is described hereinafter, the presence of "ON" edge sites is used to modify smoothing or filtering processes so as to preserve specified edges.
> 2.2. Smoothing Process
> The edge smoothing process of the first embodiment involves

applying a linear smoothing filter to each colour component resulting in all the colour components being smoothed identically. To preserve the detected edges, the convolution kernel of the filter is modified dependent upon the outcome of the edge detection for a target pixel. In particular, the filter values corresponding to the pixels surrounding the detected edge are set to zero.
In the smoothing process, any linear smoothing filter may be used. The modifications to be made to the filter are described with reference to a convolution kernel 500 that is preferably 3.times.3 pixels in size, as shown in FIG. 5. The three kernel values in the first row, from the first column to the third column, are referred to as Va, Vb and Vc, respectively. The three kernel values in the second row, from the first column to the third column, are Vd, Ve and Vf, respectively. The three values in the third row, from the first to the third column, are Vg, Vh and Vi, respectively. These values are normalised by a normalisation factor of 1/N, where N is the sum of all coefficients. For example, a 4-neighbour mean filter may be used. The classical formulation for this particular convolution kernel is given in Table 3.
TABLE 3 ##EQU3## Example of smoothing filter
In the convolution kernel of Table 3, the kernel values Vb Vd=Vf=Vh=1, the kernel values Va=Vc=Ve=Vg=Vi=0, and N=4.
In the following description, the smoothing process of the first embodiment is described in relation to three possible forms of this processing, that is full smoothing, no smoothing, and modified smoothing.
2.2.2. Full Smoothing
If the four edge sites of a target pixel are "OFF" and either the horizontal or the vertical gradient is an absolute local minima, the target pixel is likely to belong to an oblique line. Therefore, unmodified or full smoothing filter is applied to the target pixel.

(See Le, col. 12, line 55 - col. 13, line 60)

The above text says nothing about adjusting the exposure of an image. (See - Exposure The quantity of light allowed to act on a photographic material; a product of the intensity (controlled by the lens opening) and the duration (controlled by the shutter speed or enlarging time) of light striking the film or paper. A Glossary of Photographic Terms © Copyright 2004-2007 Eastman Kodak Company - http://www.kodak.com/global/en/consumer/glossary/termsE.shtml)

In contrast, claim 1 calls for "adjusting exposure of the in vivo images in the low brightness areas due to under exposure". Lee does not teach or suggest such and nor does Yokoi.

Similarly claim 11 recites " adjusting exposure of the in vivo images" and it also patentably distinguishes.

The dependent claims depend from the above-discussed independent claims and are patentable over the prior art for the reasons discussed above. The

dependent claims also recite additional features not taught or suggested by the prior art. For example, claim 2 calls for gathering image statistics and using them to adjust exposure. Claim 4 calls for forming a skeleton image that is tested. The prior art does not teach or suggest such. It is submitted that the dependent claims are independently patentable over the prior art.

New claim 29 emphasizes "b) preserving a shape of the anatomical structures in low brightness areas where light rays are unable to reach directly in the in vivo images; and c) adjusting exposure of the in vivo images in the low brightness areas due to under exposure". It is submitted that claim 29 also patentably distinguishes.

Summary

Should the Examiner consider that additional amendments are necessary to place the application in condition for allowance, the favor is requested of a telephone call to the undersigned counsel for the purpose of discussing such amendments.

For the reasons set forth above, it is believed that the application is in condition for allowance. Accordingly, reconsideration and favorable action are respectfully solicited.

Respectfully submitted,

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